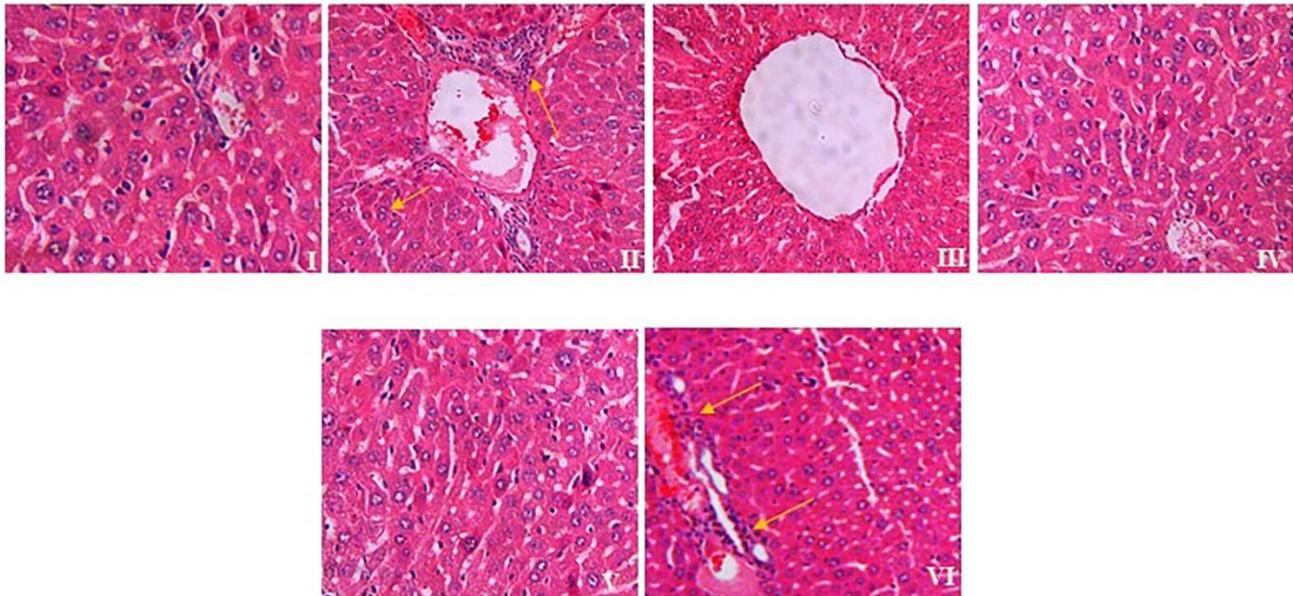


SUPPLEMENTARY FIGURES

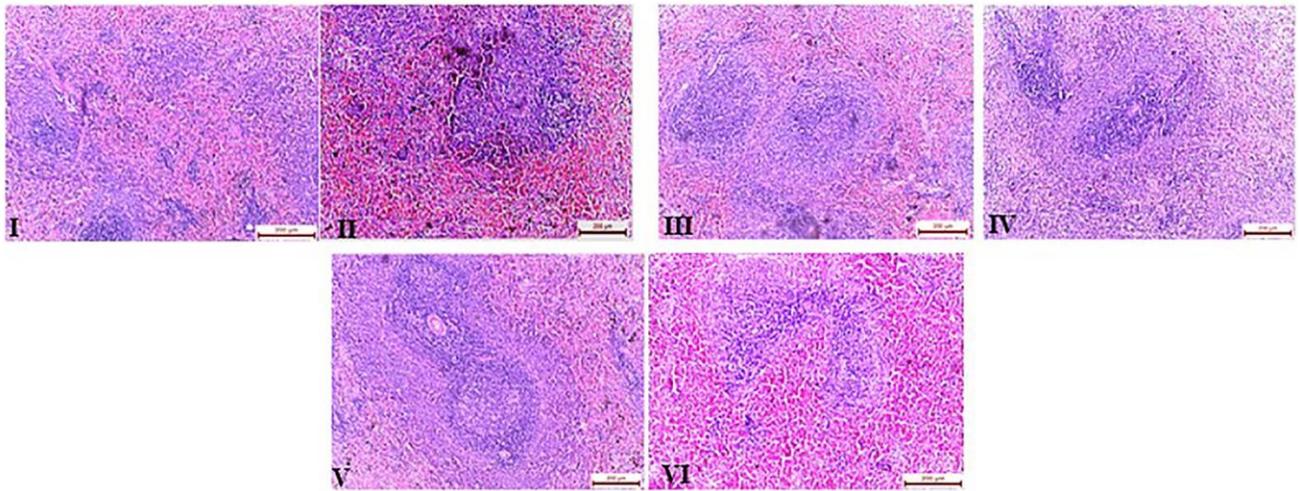
A



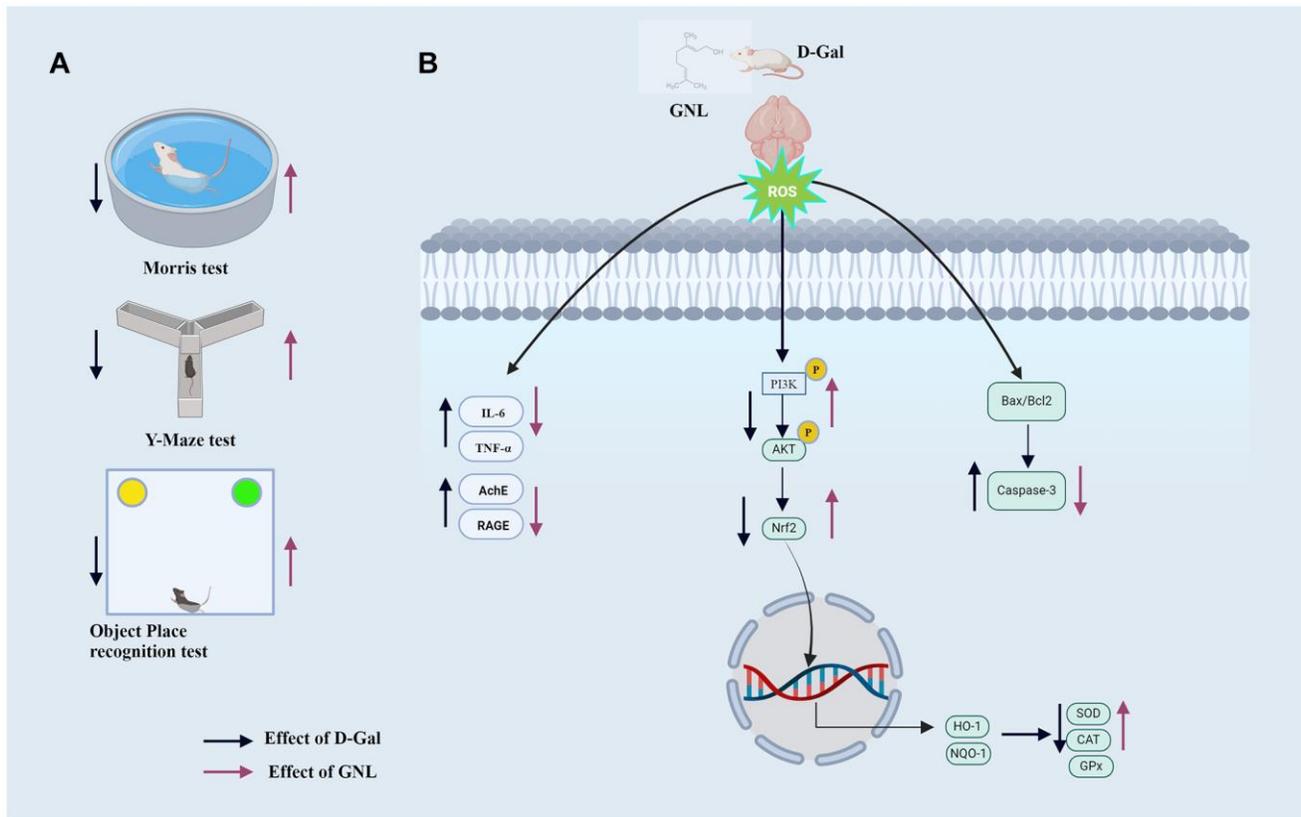
B

Groups	N	Histopathological grade value	
		Hepatocytes necrosis	Inflammatory cell infiltration
Control	6	0.0 ± 0	0.0 ± 0
D-Gal alone	6	5.37 ± 0.97*	3.21 ± 0.29 [#]
GNL with D-Gal	6	2.43 ± 0.21 [#]	1.75 ± 0.18 [#]
GNL	6	0.0 ± 0	0.0 ± 0
4 month old	6	0.0 ± 0	0.0 ± 0
16 month old	6	4.8637 ± 0.34*	5.34 ± 0.31 [#]

Supplementary Figure 1. The liver of a mouse (H&E, 400×). Staining of liver tissue with H&E after treatment with D-gal alone or with D-gal and GNL together. (A) Panel (I) Control hepatocyte cords and nuclei, the central vein, and normal hepatocytes. (II) D-gal alone. Arrows indicate infiltrated inflammatory cells. (III) GNL with D-gal, less sinusoidal congestion, and some infiltrating inflammatory cells. (IV) GNL alone, showing normal architecture. (V) Hepatocyte cords (Hc) of 4-month-old mice, clearly visible nuclei of hepatocytes, central vein, and normal hepatocytes. (VI) Normal-aged mice (16 months); the arrow indicates infiltrated inflammation, just like the mice treated with D-gal only. (B) Hepatocyte necrosis and inflammatory cell infiltration into the liver were graded histopathologically (*n* = 6). Data represent mean ± SD. **P* < 0.05 vs. control group; [#]*P* < 0.05 vs. D-gal-only treated mice. @*P* < 0.05 young vs. old mice.



Supplementary Figure 2. Mouse spleen tissue (H&E, 400×). The image shows H&E staining of spleen tissue from mice treated with D-gal alone or with both D-gal and GNL. The H&E-stained section of spleen tissue showed a high degree of morphologic organization in the control group (Group I), D-gal with GNL (III), and GNL alone (IV)-treated animals, while the density of inflammatory cells decreased in both the D-gal-induced aging group (II) and the control (naturally) aging group (VI). Group I: Control; Group II: D-gal alone (150 mg/wt); Group III: D-gal (150 mg/wt) with GNL (40 mg/wt); and Group IV: GNL alone (40 mg/wt). Group V: 4 month-old young animals; Group VI: 16 month-old.



Supplementary Figure 3. Effect of GNL on D-gal induced aging in mice. (A) Effect of GNL on aging behavior. (B) Effect of GNL on biochemical and molecular mechanism of aging. Image created with <https://www.biorender.com/> (dated 03/02/2024).